

The paragraph beginning on line 19 through 20 of page 9 has been amended as follows:

FIGS. 1 and 2 are [s]circuit schematics illustrating arc fault protection for series and parallel arcs respectively, in accordance with embodiments of the invention;

The paragraph beginning on line 24 of page 9 has been amended as follows:

FIGS. 5, 6 and 7 [and 6] illustrate alternate types of differential current sensors.

The paragraph beginning on line 20 of page 10 through line 5 of page 11 has been amended as follows:

The sensor 34 may be of the configuration shown in FIG. 3 wherein two conductors 50 and 52, which may be rigid busses if desired, are arranged to pass through a magnetic core 60 in such a way that the currents on the two conductors 50 and 52 travel in opposite directions through the core 60. The conductors 50, 52 are connected to the terminals 30, 32 and to the wires 22, 20. The core 60 is provided with a coil 62 on which an output signal is developed which corresponds to any difference in the current between the two conductors 50 and 52. Since identical parallel insulated conductors are used, the output of the coil 62 should be essentially zero in the absence of any arcing faults in the zone. However, any series arc in the connections of one of the conductors of the zone will create or generate a circulating current which will pass through the source tie point, that is, the point at which the [wires] conductors 50, 52 are coupled to the source end or input, and also through the arc sensing detection core 60. This circulating current will be detected and a fault will be sensed as the result of an output current on the output coil 62. Line-to-line or line-to-ground faults will generate relatively large fault currents which are sensed directly by the arc detecting magnetic core 60. An arc detector [(not shown)] 63 may be coupled with the output coil 62 and this arc detector may respond to the current in the output coil 62 for producing a trip signal to trip the breaker in the event this current exceeds some predetermined threshold value.

The paragraph on page 11, line 24, has been amended and a new paragraph added as follows:

Referring to FIG. 4, a special case exists if the bifurcated wire system is to be tapped for multiple loads. If it is desired that the zone of arc detection extend to each load, then an iron core balancing core 42a must be attached in each bifurcated wire at each tapped load 43. In this way a series or parallel arc anywhere in the tapped circuit generates a current imbalance which is detected at the source current-difference-detector (differential sensor) 34. If the balancing cores are not used, then a series fault located after the first tap generates a circulating current that is shorted out by the first tap and may not be detected at the detector located at the source breaker. If coordination is desired between the source breaker and a breaker at the load, then a second differential current detector 34a, 34b, etc. is incorporated in the balancing cores at the load with faster trip curves.

The paragraph beginning on line 20 of page 10 through line 5 of page 11 has been amended as follows:

The sensor 34 may be of the configuration shown in FIG. 3 wherein two conductors 50 and 52, which may be rigid busses if desired, are arranged to pass through a magnetic core 60 in such a way that the currents on the two conductors 50 and 52 travel in opposite directions through the core 60. The conductors 50, 52 are connected to the terminals 30, 32 and to the wires 22, 20. The core 60 is provided with a coil 62 on which an output signal is developed which corresponds to any difference in the current between the two conductors 50 and 52. Since identical parallel insulated conductors are used, the output of the coil 62 should be essentially zero in the absence of any arcing faults in the zone. However, any series arc in the connections of one of the conductors of the zone will create or generate a circulating current which will pass through the source tie point, that is, the point at which the wires 50, 52 are coupled to the source end or input, and also through the arc sensing detection core 60. This circulating current will be detected and a fault will be sensed as the result of an output current on the output coil 62. Line-to-line or line-to-ground faults will generate relatively large fault currents which are sensed directly by the arc detecting magnetic core 60. An arc detector [(not shown)] 63 may be coupled with the output coil 62 and this arc detector may respond to the current in the output coil 62 for producing a trip signal to trip the breaker in the event this current exceeds some predetermined threshold value.

The paragraph beginning on line 28 through line 29 on page 13 has been amended as follows: